



GS 114-7

HVAC - SOUND ATTENUATORS FOR OFFSHORE USE

August 1993

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BP GROUP RECOMMENDED PRACTICES AND SPECIFICATIONS FOR ENGINEERING											
Doc. No. GS 114-7		Issue Date August 1993	Latest Amendment Date								
Document Title HVAC - SOUND ATTENUATORS FOR OFFSHORE USE											
APPLICABILITY - Does not preclude adaptation for other applications Regional Applicability: United Kingdom											
SCOPE AND PURPOSE This document specifies the general requirements for the design and construction for HVAC Sound Attenuators for use offshore. Its purpose is for the specification of fit-for-purpose HVAC Sound Attenuators at minimum cost.											
AMENDMENTS <table border="0"> <thead> <tr> <th>Amd</th> <th>Date</th> <th>Page(s)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td colspan="4"> </td> </tr> </tbody> </table>				Amd	Date	Page(s)	Description				
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CUSTODIAN (See Quarterly Status List for Contact) Mechanical Systems											
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FOREWORD

Introduction to BP Group Recommended Practices and Specifications for Engineering

The Introductory Volume contains a series of documents that provide an introduction to the BP Group Recommended Practices and Specifications for Engineering (RPSEs). In particular, the 'General Foreword' sets out the philosophy of the RPSEs. Other documents in the Introductory Volume provide general guidance on using the RPSEs and background information to Engineering Standards in BP. There are also recommendations for specific definitions and requirements.

Value of this Guidance for Specification

This Guidance for Specification was developed under the BP Exploration XEU Simple Specifications Initiative. This initiative is intended to simplify the purchasing requirements through a minimum conditions of satisfaction approach in regions where there is a mature supplier resource.

Application

This Guidance for Specification is intended to guide the purchaser in the use or creation of a fit-for-purpose specification for enquiry or purchasing activity.

Text in *italics* is Commentary. Commentary provides background information which supports the requirements of the Specification, and may discuss alternative options.

This document may refer to certain local, national or international regulations but the responsible to ensure compliance with legislation and any other statutory requirements lies with the user. The user should adapt or supplement this document to ensure compliance for the specific application.

Specification Ready for Application

A Specification (BP Spec 114-7) is available which may be suitable for enquiry or purchasing without modification. It is derived from this BP Group Guidance for Specification by retaining the technical body unaltered but omitting all commentary, omitting the data page and inserting a modified Foreword.

Feedback and Further Information

Users are invited to feed back any comments and to detail experiences in the application of BP RPSE's to assist in the process of their continuous improvement.

For feedback and further information, please contact Standards Group, BP International or the Custodian. See Quarterly Status List for contacts.



1. INTRODUCTION

1.1 Scope

This document specifies the requirements for Sound Attenuators for use on hydrocarbon production, processing and export facilities offshore.

The Vendor's scope shall include the following:-

Sound Attenuators complete with casing, flanges and lifting eyes.

Provision of Documentation:-

- (a) General Arrangements.
- (b) Sound Spectrum Schedule.

1.2 Quality Assurance

Verification of the vendor's quality system is normally part of the pre-qualification procedure, and is therefore not specified in the core text of this specification. If this is not the case, clauses should be inserted to require the vendor to operate and be prepared to demonstrate the quality system to the purchaser. The quality system should ensure that the technical and QA requirements specified in the enquiry and purchase documents are applied to all materials, equipment and services provided by sub-contractors and to any free issue materials.

Further suggestions may be found in the BP Group RPSEs Introductory Volume

2. GENERAL

2.1 Documentation

- 2.1.1 This Specification shall be read in conjunction with an enquiry or purchase order and the accompanying data sheets.

2.2 Exceptions

- 2.2.1 Tenders for the supply of Sound Attenuators shall include either an unqualified affirmation regarding compliance with the specification or a complete list of detailed exceptions.
- 2.2.2 A Vendor may offer alternative suitable proposals where price, delivery or technical advantage may accrue, but such proposals shall be in addition to the main bid/tender.



2.3 Conflicts

- 2.3.1 If any of the reference documents conflict, and definition is not established by the provisions of Section 3 of this Specification, then the Vendor or his sub-supplier shall bring this to the attention of the Purchaser.

3. STANDARD DESIGN REQUIREMENTS

3.1 Design

- 3.1.1 All materials shall be in accordance with [BS 476 Parts 4 and 7](#) i.e. non-combustible and non-smoke producing.
- 3.1.2 Sound Attenuators should be suitable for a maximum duct static pressure of 1500 Pa, and a leakage rate as nominated in DW 142 for class 'D' ductwork.
- 3.1.3 The Sound Attenuators shall have flanged connections, suitable for mounting within ductwork systems, with a minimum thickness of 2 mm.
- 3.1.4 Stainless steel, fully welded, attenuators shall have no permitted leakage.
- 3.1.5 Sound attenuators shall be selected to achieve the sound reductions specified and have a low resistance to air flow. The attenuation material shall possess in addition to the above, the following properties:-
- (i) Adequate strength and cohesion to prevent sagging.
 - (ii) Resistant to erosion.
 - (iii) Prevent disintegration and migration.
 - (iv) Odour free.
 - (v) Non-dust producing.
 - (vi) Non-hygroscopic.
 - (vii) Not support mould growth.
 - (viii) Asbestos free.
 - (ix) Rot and vermin proof.

3.2 General Construction

- 3.2.1 Attenuators shall be constructed from either galvanised steel sheet or stainless steel, as indicated on the Data Sheets.



- 3.2.2 Attenuators within enclosed areas shall be constructed from 1.6 mm thick galvanised mild steel casing with 1.2 mm thick galvanised mild steel internal splitters to [BS 1449 Part 1](#) and [BS 2989](#) with a minimum coating of 276 g/m².
- 3.2.3 Attenuators installed externally, or handling external or contaminated air shall be constructed from stainless steel plate with a minimum thickness of 3 mm with internal splitters with a minimum thickness of 1.2 mm from stainless steel to [BS 1449 Part 2](#) grade 316L.
- 3.2.4 Stainless steel attenuators shall be fully welded.
- 3.2.5 The internal splitters shall be perforated and riveted for galvanised materials, but shall be welded for the stainless steel construction.
- 3.2.6 The splitters shall encase an infill of inorganic mineral fibre packed to a density of 48 kg/m³. A melinex polyester film sheet, which shall be flame retardant to [BS 476 Parts 4 and 7](#), shall be fitted between the infill and perforated steel to prevent particles of sound absorbent medium passing into the air-stream.
- 3.2.7 Where stated on the Data Sheets the material thickness of the casing shall be increased and the construction modified to meet the fire rating of the adjoining ductwork.
- 3.2.8 The entry and exit from the attenuators shall be aerodynamically shaped to minimise the static pressure losses.
- 3.2.9 Circular attenuators shall have an inner cone if the performance requirements necessitate this. The cone shall be securely fixed to the outer cylinder by supporting rods. The inner cone and caps shall be 2 mm thick and of the same material as the casing.
- 3.2.10 All angle shaped attenuators shall have guide vanes. The guide vanes shall be the same material as the casing and should have a minimum thickness of 1.6 mm; depending on the materials being used, they should be either riveted or welded to the inner face of the casing.
- 3.2.11 All Sound Attenuators shall have the Vendors standard nameplate containing the following information:
- Project Name
PO Number
Vendors serial number
Year of manufacture
Tag number
Air volume m³/s



Air pressure drop Pa
Airflow indication arrow
Weight kg

- 3.2.12 The Vendor shall provide a self adhesive label, 50 mm high, black on white, quoting the sound attenuator tag number only.
- 3.2.13 All sound attenuators shall be provided with lifting lugs or eyes at both ends of the assembly.



DEFINITIONS AND ABBREVIATIONS

Definitions

Standardised definitions may be found in the BP Group RPSEs Introductory Volume.

Abbreviations



LIST OF REFERENCED DOCUMENTS

A reference invokes the latest published issue or amendment unless stated otherwise.

Referenced standards may be replaced by equivalent standards that are internationally or otherwise recognised provided that it can be shown to the satisfaction of the purchaser's professional engineer that they meet or exceed the requirements of the referenced standards.

British Standards

BS 476	Fire test on building materials and structures: Part 4 and Part 7
BS 1449	Steel Plate, sheet and strip Part 1 and Part 2.
BS 1706	Electro plated coatings for cadmium and zinc on iron and steel.
BS 2989	Specification for continuously hot dip zinc coated and iron zinc alloy coated steel flat products: tolerances on dimensions and shape.
BS 4718	Method of test for silencers for air distribution systems.
BS 6443	Method for penetrant flaw detection.
DW 142	Specification for sheet metal ductwork.

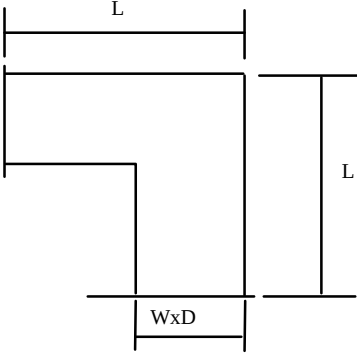


DATA SHEET

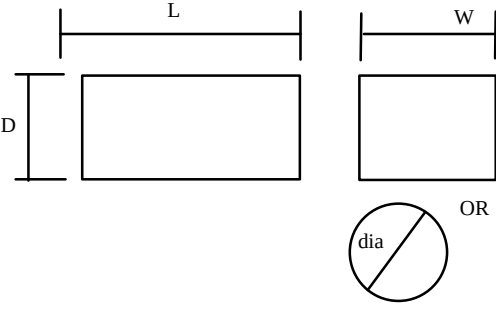
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Sound Attenuators

PROJECT		MODULE/AREA/LOCATION		DOC REF NO.		
CONTRACTOR		FLOW DRG NO.				REV
SYSTEM AND SERVICE		LAYOUT DRG NO.				REV
EQUIPMENT TAG NO.						REV
TECHNICAL DETAILS		UNITS	DESIGN		VENDOR	
1	Air Volume	m ³ /s				
2	Ductwork Velocity	m/s				
3	Attenuator Velocity	m/s				
4	Weight	Kg				
5	Size	mm				
6	Overall Length Flange to Flange	mm				
7	Mounting	-	H	V	H V	
8	Splitters Position	-	H	V	H V	
9	Pressure Loss	Pa				
10	Ductwork Size	mm				
11	Mid Frequency Octave Band Hz					
12	Required Dynamic Insertion Loss db	63 Hz	125	250	500 1K 2K 4K 8K	
13	Vendor Dynamic Insertion Loss db					
14	Vendor Self Noise (db) 10 ⁻¹² W					
15	MATERIALS CONSTRUCTION				VENDOR	
16	Casing	-				
17	Casing Thickness	mm				
18	Splitter/Pod Material	-				
19	Flange Size	mm				
20	Acoustic Material	-				
21	Retaining Face Material	-				



BEND ATTENUATOR SIZE



OR



ATENUATOR SIZE

